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The thesis reviews the works of Total Quality writers and behavioral scientists for any connection they might have made between intrinsic motivation and quality. The thesis then looks at the works of Deming and his followers in an attempt to establish a match between Deming's motivational assumptions and the four task rewards in the Thomas/Tymon model of intrinsic motivation: choice, competence, meaningfulness, and progress.

Based upon this analysis, it is proposed that the four Thomas/Tymon task rewards are a promising theoretical foundation for explaining the motivational basis of quality for workers in Total Quality organizations.

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Exploring the Link Between Intrinsic Motivation and Quality

by

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Submitted in partial fulfillment
of the requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

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ABSTRACT

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TABLE OF CONTENTS

I. INTRODUCTION AND BACKGROUND 1

- A. RECOGNIZING QUALITY 1
- B. RESPONSES TO THE IMPORTANCE OF QUALITY 1
- C. MOTIVATION FOR QUALITY 3
- D. THE LINK BETWEEN INTRINSIC MOTIVATION AND QUALITY 3
- E. ORGANIZATION OF THE THESIS 4

II. QUALITY 6

- A. STAKEHOLDERS 6
- B. MANAGERS 7
- C. CUSTOMERS 8
- D. WORKERS 10
- E. CONCLUSION 13

III. INTRINSIC MOTIVATION 14

- A. DEFINITION OF INTRINSIC MOTIVATION 15
- B. TOTAL QUALITY MANAGEMENT WRITERS ON INTRINSIC MOTIVATION 17
- C. DEMING ON INTRINSIC MOTIVATION 19
- D. BEHAVIORAL SCIENTISTS ON INTRINSIC MOTIVATION AND QUALITY 27

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E. CONCLUSION 31

IV. A SPECIFIC MODEL OF INTRINSIC MOTIVATION 33
A. HERZBERG'S MOTIVATION-HYGIENE THEORY 34
B. HACKMAN AND OLDHAM'S JOB CHARACTERISTICS MODEL 35
C. DECI AND RYAN'S THEORY OF INTRINSIC MOTIVATION 36
D. THOMAS AND VELTHOUSE'S INTERPRETIVE MODEL OF INTRINSIC MOTIVATION 37
E. EXTENSION OF THE THOMAS/VELTHOUSE MODEL BY THOMAS AND TYMON 40
F. CONCLUSION 43

V. HOW WELL DOES THE THOMAS/TYMON MODEL FIT DEMING? . 45
A. THE FOURTEEN POINTS 45
B. DEMING'S WRITINGS, PART I: CHOICE AND COMPETENCE 46
1. Choice 47
2. Competence 48
C. DEMING'S WRITINGS, PART II: MEANINGFULNESS AND PROGRESS 52
1. Meaningfulness 52
2. Progress 56
D. CONCLUSION 58

VI. SUMMARY AND RECOMMENDATIONS 59
A. QUALITY 59

B. INTRINSIC MOTIVATION 60

C. INTRINSIC TASK REWARDS 61

D. MATCHING THOMAS/TYMON TO DEMING 62

E. RECOMMENDATIONS 62

1. Total Quality Theory 62

2. Future research 64

F. CONCLUSION 65

LIST OF REFERENCES 66

BIBLIOGRAPHY 69

INITIAL DISTRIBUTION LIST 72

LIST OF FIGURES

FIGURE 1 - THOMAS/TYMON EMPOWERMENT MODEL. 41

I. INTRODUCTION AND BACKGROUND

A. RECOGNIZING QUALITY

In recent years we have witnessed a shift in performance standards in American industry, a change from a dominant emphasis upon quantity of production to an increased emphasis on quality of work performed. Quality has become such an important ingredient to commercial competitiveness that many industrial organizations regard it as a "strategic weapon" (Applegate, 1991, p.9) in their industrial arsenals.

B. RESPONSES TO THE IMPORTANCE OF QUALITY

As testimony to the importance of quality to American commerce, Congress established the Malcolm Baldridge Award. Named for the former Secretary of Commerce, this award recognizes American companies for their strides in integrating quality into their products and services, and for earning top rankings in their competitive fields.

The Department of Defense, also recognizing the need for emphasis upon quality, has over the years shifted its improvement efforts from "productivity" improvement to "total performance" improvement to Total Quality Management.

Secretary of Defense Carlucci, in 1988, said he was giving "top priority to the DOD Total Quality Management effort as the vehicle for attaining continuous quality improvement in our operations" (Carlucci, 1988, p 2). Within the Navy, CNO ADM Kelso has further stated that "quality will become ever more important" to the Department of the Navy, and indeed, to the rest of the services (Kelso, 1991, p 30).

Why have American firms and the Department of Defense so strongly adopted the philosophy of Total Quality? They are responding to the changing world around them. In today's world, the successful organization recognizes the importance of quality to its customers and the role of the customer in determining quality. The successful organization can change itself to meet these new requirements and roles. But an organization doesn't change easily. Naisbitt (1982) claims that two "crucial elements" must be present for societies and corporations to change--new values and economic necessity. New values, Naisbitt (1982) explains, means that extrinsic rewards are not enough to motivate workers facing these upheavals and disruptions; money is not their driving factor. The economic necessity of which he speaks is evident all around us today as we witness a "downshift" in the American economy and its slipping status in the world market, and the resulting convulsions throughout the workplace and in the military in the form of cutbacks, downsizing and restructuring.

C. MOTIVATION FOR QUALITY

The way out of America's economic malaise, and the way to win back global market share, say many management gurus, is to focus on quality, as was noted above. But the question remains how best to motivate workers to achieve quality? If, as Naisbitt claims, monetary or extrinsic rewards alone won't do it, what will? Fiegenbaum (1991) writes of a need for quality education of, and for improved communication of quality consciousness to, today's workers. He says that in addition to monetary reward, today's workers "require reinforcement of a sense of personally contributing to achievement of company goals" (p. 60).

But it is not clear to today's managers whether giving people "monetary rewards, information on 'why,' participation in planning, wider responsibility, threats and penalties, emotional appeals, awards or prizes" (Juran and Gryna, 1980, p. 110) will motivate workers to produce quality. There is a need for someone to take the initiative on such matters, they write, as quality managers thus far have made little progress in developing broad concepts. "As a result," they say, "there is a role waiting for an actor" (p. 110).

D. THE LINK BETWEEN INTRINSIC MOTIVATION AND QUALITY

This thesis suggests that it is workers' intrinsic motivation which will lead them to produce quality. It reviews the evidence of empirical studies and the works of management writers, and asks, "What does this evidence say about the link between intrinsic motivation and quality?" And if that link does exist, what motivational principles lead to work quality? That is, what does it take to get people to produce quality work?

E. ORGANIZATION OF THE THESIS

Chapter II of this thesis explores the changing meaning of "quality" through the years. It notes that quality can have different meanings for the principal participants in any discussion on quality--managers, customers and workers. It culminates in a working definition of quality.

Chapter III traces the evolution of thought leading up to intrinsic motivation theory, and takes from Thomas and Velthouse (1990) a definition of intrinsic motivation for use in this thesis. It also reviews the works of Total Quality writers and behavioral scientists for any connection that might have been made between intrinsic motivation and quality.

Chapter IV reviews previous models of intrinsic motivation, ending with a discussion of the model developed by Thomas and Tymon.

Chapter V attempts to establish a match between Deming's motivational assumptions implicit in his writings and the four task rewards in the Thomas/Tymon model.

Chapter VI concludes the thesis with recommendations for studies further examining the connections between intrinsic motivation and quality, and which would lead to guidelines and management tools for practitioners of Total Quality.

II. QUALITY

A. STAKEHOLDERS

A precise definition of quality remains elusive. Perhaps because it is "not conventionally measured" (Johnston & Packer, 1987, p. 33) as a factor in a firm's productivity, its definition remains ambiguous. The attempt here, however, is more limited--to gain a general working definition of quality for use in this thesis. This thesis will draw upon the writing in the popular press by the "quality gurus" and those who have followed and written about them; from the field of process engineering and from behavioral scientists. In doing so, this thesis will trace the shift in attitudes toward quality over the years, while looking at quality from the points of view of three important "stakeholders" in any situation--management, the customer, and the worker.

Stakeholders, says Thompson (cited in Freeman, 1984, p. 24), are "those groups which make a difference" to the organization. Freeman builds upon Thompson, offering a more formal definition of a stakeholder and introducing the concept of stakeholders sharing in the organization's goals:

> A stakeholder in an organization is (by definition) a group or individual who can affect or is affected by the achievement of the organization's objectives (Freeman, 1984, p. 24).

Freeman (1984) lists owners, customers, suppliers, employees, governments and competitors as just a few categories of stakeholders, both internal and external to the organization, which hold interest in a firm's activities. These stakeholders, and the firm, sway each other as they wield their economic, technological, social, political and managerial affects (Freeman, 1984).

As noted above, three stakeholder groups are of interest in this thesis: managers, customers, and workers.

B. MANAGERS

Taylor's "scientific management" is a leading example of traditional models of management which emphasized the need for managers to gain "efficiency and control" (Beer, Spector, Lawrence, Mills & Walton, 1984, p. 168). In these models, managers were the definers of quality: for the organization, for the customer, and for the worker. It was the manager's definition of quality that customers "bought" and that workers followed. This philosophy was widespread, and in some situations continues to this day.

To gain efficiency, scientific managers attempted to apply scientific principles to the management of workers, and divided work into relatively simple and specialized tasks to gain "maximum efficiency at desired costs" (Beer et al., 1987, p. 157). Managers were urged to define precisely the workers' limited tasks, leaving little discretion to the workers.

(Walton, 1986, p. 9) They promoted worker compliance through close supervision, piece-work incentives, production bonuses and "carrot and stick" reward and punishment schemes. To exert control over workers, managers in the traditional model incorporated their definition of quality into their control systems. Quality work was work that met the "specs" adopted by managers, and bad quality was "inspected out" by post-production checkers (Deming, quoted in Walton, 1990, p. 60) after the work was completed. They checked for "absence of defects" (Gabor, 1990, p. 8), and "conformance to requirements," (Crosby, 1990, p. 9).

This idea of quality, and the scientific management methods that spawned it, has lasted for decades. According to Juran and Gryna (1970) it is seen as both a philosophy of management and an approach to worker motivation through piecework incentives (p. 153). But, they add, motivation through piecework has been in long-range decline, and scientific management, "now characterized as a pessimistic view of an organization's human resources" (Beer et al., 1987, p. 157) is giving way to new views.

C. CUSTOMERS

After World War II, most American manufacturers were hard pressed to keep up production to meet the suddenly-released demands of consumers here and abroad. To American manufacturers, pressing for high production numbers, quality came to mean "fancy features and high prices" (Gabor, 1990, p. 8). In time, though, these "fancy features" added onto a product weren't enough to ensure its quality to consumers. Customers began to demand more from the products and from their manufacturers.

The customer's viewpoint has become so important, says Deming, because "quality has meaning only in terms of the customer, his needs, what he is going to use it for" (Walton, p. 28). "Quality is a customer determination," Fiegenbaum (1991) says, "based on a customer's actual experience with a product or service, measured against his or her requirements" (p. 7).

According to Deming and other writers on total quality, a firm desiring to produce quality goods for its customers must anticipate the needs of the customer, translate those needs into a useful and dependable product, and create a system that can produce the product at the lowest possible price so that it represents "good value" to the consumer (and profits for the enterprise) (Gabor, 1990, p. 10). Quality must be "built in at the design stage," Deming said (Walton, 1986, p. 66). Echoing the concept, and harking back to Taylorism's inspection processes, Fiegenbaum (1991) claims that "Quality must be designed and built into a product; it can not be exhorted or inspected into it" (p. 77). Again, Deming adds that "quality comes not from inspection but from improvement of the process. The old way," he said, was to "inspect bad quality out. The new way: build good quality in" (Walton, 1986, p. 60).

Here one sees the emphasis Deming places on both the customer and upon the firm's process. By aligning management's definition of quality with the customer, the firm builds customer satisfaction and loyalty. By emphasizing the process of its business and continuously improving the process and thus its product--the firm will gain repeat business.

D. WORKERS

As emphasis has shifted away from inspection and tight controls over workers, it is becoming clear that much of quality comes from the efforts of the workers who build quality into products. Accordingly, some management writers and practitioners are beginning to recognize the importance of the worker's internal criteria to producing quality. Scientific management's tight controls and monetary rewards haven't been enough to keep U.S. firms competitive and productive in today's quality markets. Beer et al. (1987) see a new model of the workplace emerging, what they call a "high-commitment work system" (p. 168). In this system, workers' commitment to the organization's goals is gained by "direct attention to the integration of individual needs and organizational requirements, and to achieve control and efficiency as a second-order consequence" (Beer et al., 1987, p. 68).

According to this view, the tight controls of past management systems must give way to looser checks and increased trust in employees' dedication to and motivation for quality. "Effective human relations is basic to quality control," Fiegenbaum (1991) says. A major effect of this activity is "building up employee responsibility for, and interest in, product quality" (p. 44).

To appreciate the increasing importance of the workers' internalized criteria for quality, consider the judgments required of workers in Total Quality versus traditional scientific management organizations. In either organization, the process begins with a product or service and a customer. Managers identify a vision of what would please the customer--the manager's definition of quality. Meeting that goal, then, becomes the overriding purpose for the manager and workers. To meet that purpose, the managers then design a process, which is a sequence of activities. Sets of these task activities are in turn grouped together by the managers into job tasks that are assigned to individuals. Managers give some notion to the individual of the criteria which will be used to evaluate work activities, and then to distinguish less competent from more competent performances.

From here, however, there is a divergence between the practices of the classic or scientific manager and the manager in a Total Quality system. For the classicist, this is the end of the process. The worker strives to meet the manager's evaluation criteria, which is presumed to result in a quality product that satisfies the manager's notion of the customer's need. Managers have developed elaborate "carrot and stick" programs of rewards and punishments intended to keep the worker on this path and turning out managers' notions of quality--what they think the customer wants, and in numbers the managers demand. All too often, today's quality writers relate, this system produces quite the opposite of quality, and not always what the customer needs.

For the Total Quality manager, though, this point of divergence is just the beginning, as the manager and the workers now take up the process of continuous improvement of the process. Starting with the initial managerial vision of the product or service and quality with which to meet the customer's need, they can constantly compare their output against the customer's reported satisfaction and against their previous measures of efficiency.

Customers are asked to recommend changes in the product or service that better meet their requirements, which may be evolving and changing, becoming Fiegenbaum's (1991) "moving target" (p. 7).

In turn, workers are asked to make recommendations for improvements in their task activities that will further the efficiency of the process and improve the quality of the product, both in their eyes and in the customer's view.

E. CONCLUSION

In the Total Quality view, then, it is the convergence of views held by the three stakeholders--managers, customers and workers--that defines quality. This convergence of views may be negotiated among the three stakeholders, but each stakeholder must embrace the new definitions and requirements.

Thus, this thesis proposes the following working definition of quality:

> Quality is an evaluation of work performed, product made or service rendered according to criteria negotiated by the three primary stakeholders in the process--managers, customers and workers.

It appears that a new role is emerging for the worker in a Total Quality system, as well as an increasing responsibility as regards quality. It is a far cry from the role in the traditional scientific management model, in which the manager defined quality for the customer and the worker merely complied. In the Total Quality model, workers not only have their traditional role--to turn out quality work--they also share a major responsibility in helping to define and improve quality. This they do in discussion and negotiation with the other two primary stakeholders--managers and customers.

III. INTRINSIC MOTIVATION

With increasing recognition of the role of the worker in contributing to the definition and production of quality in Total Quality organizations, managers must recognize that their job now is to gain their workers' commitment to quality. A manager in the traditional model might say that to do this he must "motivate" his workers, but Deming says you cannot "motivate" people--they are already motivated, they are born with intrinsic motivation (Scherkenbach, 1991, p. 264). What he means is that external motivators, as espoused by the Scientific Management theorists, will not gain lasting commitment to quality; it is a worker's internal dedication, his intrinsic motivation, that will cause a worker to consistently produce quality work.

The first part of this chapter will provide an overview of the many definitions of intrinsic motivation, and offer a working definition for this thesis. The rest of this chapter will show what the quality gurus say about intrinsic motivation and quality work, elaborate on Deming's views on intrinsic motivation, and summarize the results of empirical studies showing a relationship between intrinsic motivation and quality.

A. DEFINITION OF INTRINSIC MOTIVATION

To draw upon a worker's intrinsic motivation, a manager first must know what it is. There exist several models of intrinsic motivation, but at present, there is no consensual agreement on a precise definition (Lee, 1987). Broedling (1977) in her review of the uses the terms intrinsic and extrinsic motivation, surmises that "intrinsic" became a "catchall explanation whenever behaviors occur which cannot be clearly linked to external outcomes" (p. 268).

However, two common themes emerge from the various definitions of intrinsic motivation. One "common thread," Broedling (1977) said, is "the individual's perception of control, of both environmental events and his/her own behavior" (p. 274). That is, an individual's motivation comes from the self, not from others. For example, deCharm (cited in Lee, 1987, p. 8) said that man strives for personal causation and wishes to be the "origin" of his own behavior. Further, deCharm said, a person is said to be intrinsically motivated "whenever he experiences himself as the locus of causality for his own behavior" (cited in Lee, 1987, p. 8) That is, when he sees himself as an origin of his actions, he will consider himself to be intrinsically motivated. (Notz, 1975, p.885)

The other common theme involves individuals gaining their rewards directly from the task. That is, doing the task, or having completed it, is the reward. Brief and Aldag (cited in

Tymon, 1989, p. 14) for example, state that "intrinsic work motivation is a cognitive state reflecting the extent to which the worker attributes the force of his or her task behaviors to outcomes (rewards) derived from the task per se. More simply, Lepper (cited in Lee, 1980, p.10) defined intrinsic motivation as "a process of engaging in an activity for its own sake," a definition later borrowed by Lee (1987). Likewise, Tymon (1988) said that intrinsic motivation "involves positively valued experiences associated directly with task behavior" (p. 4). These rewards or positively valued experiences are often described as positive feelings. For example, Hackman and Oldham (1980) saw the "essential property of internal work motivation as the positive feelings which follow from good performance and the negative feelings which follow from poor performance" (cited in Tymon, 1988, p. 23). Likewise, Notz (1975) paraphrased Lawler's (1969) definition of intrinsic motivation as "the degree to which feelings of esteem, growth and competence are expected to result from successful task performance" (p. 889).

This thesis will use the following definition by Thomas and Velthouse (1990):

> Intrinsic motivation involves positively valued experiences that the individual derives directly from the task" (p. 688).

This working definition includes both themes in the literature--the notion that intrinsic motivation comes from the self, and involves rewards associated with the task itself. Thus, intrinsic motivation can be contrasted with extrinsic motivation, which is based on rewards and punishments which are external to the task and are controlled by others.

B. TOTAL QUALITY MANAGEMENT WRITERS ON INTRINSIC MOTIVATION

Deming, like other Total Quality management writers, mentions intrinsic motivation and quality in nearly the same breath. But none of these writers seems to make an explicit connection between intrinsic motivation and quality, nor does any one explicitly explore a causal relation. Nevertheless, analysis of their writing indicates an implicit consensus among the Total Quality writers of the importance of workers' intrinsic motivation to the quality of their work.

The mention of intrinsic motivation can be as terse as Deming's (1991) comment: "There is intrinsic motivation" (p. 87.) But he does not explain nor define intrinsic motivation. Instead, he repeatedly uses the phrase "pride of workmanship" (Deming, 1986, p. 73). It would seem clear that his phrase "pride of workmanship" relates to a worker's intrinsic motivation to produce quality work.

Juran and Gryna (1980) also write of workers' pride of workmanship and imply that workers were self-motivating with respect to quality. Humans apparently possess an intrinsic urge to attain quality, they say, an urge to make good products rather than bad.

Parkin (1978) similarly writes of workers' intrinsic interest and pride in their work. He equates a worker's intrinsic motivation with a craftsman's identification with his work and its products.

Hodgson (cited in Gabor, 1990) notes that "employees' intrinsic motivation to do well becomes particularly pronounced" (p. 260) when a company's management undertakes a serious program of quality improvement.

"Intrinsic motivation will become increasingly more important," says Pinder (1984) "as the workforce becomes more highly educated" (p. 59). Scherkenbach (1991) says that managers must plan for ways to "tap into the intrinsic motivation which is within each person" (p. 92). Aguayo (1990) suggests that "one of management's main jobs...is to foster intrinsic motivation," (p. 101) which he calls "the engine for improvement" (p. 103).

But managers are not certain how to foster intrinsic motivation so that they may then "tap into" it. "Managers are unified in their belief that motivation is vital," say Juran and Gryna (1970), "but they are divided in how to achieve motivation" (p. 110). In addition to monetary rewards, which do not reinforce intrinsic motivation, most agree, Fiegenbaum (1991) says that "Today's workers require reinforcement of a sense of personally contributing to achievement of company goals" (p. 60).

These intrinsic rewards, says Senge (1990), "can call forth a new level of creativity and innovation" (p. 14) within workers. However, Senge notes, substituting extrinsic for intrinsic rewards will not promote progress towards quality, but will be "simply going through a set of hoops and ladders to become more competitive" (Welter, 1991, p. 42).

C. DEMING ON INTRINSIC MOTIVATION

Deming does not use the phrase "intrinsic motivation" in his book "Out of the Crisis" (1986), but it is clear he was aware of intrinsic motivation and its link to quality. Deming uses "intrinsic motivation" in later works, but he does not define it, nor does he link it directly to quality work, nor does he explain how management can foster intrinsic motivation it its own organization.

The phrase Deming (1986) uses most often is "Pride of Workmanship" (p. 73), which, taken in its various contexts in the writings of Deming and his chroniclers, would seem to equate to intrinsic motivation. The purpose of this section is to explore what Deming does say about intrinsic motivation and Pride of Workmanship, what they are and aren't, and how Pride of Workmanship matches the definition of intrinsic motivation used in this thesis.

It seems clear that Deming does understand intrinsic motivation and motivation theory. Gabor (1990) asserts that "Deming's philosophy borrows from the theories of human motivation by Herzberg, Maslow and MacGregor" (p. 12). And, it seems, Deming's philosophy borrows from Deci's (cited in Deci and Ryan, 1985) theories of intrinsic motivation and overjustification (explained later in this chapter).

Deming "fervently believes in the intrinsic motivation of mankind," wrote Gabor (1990, p. 13). "All people are motivated," Deming claims (Walton, 1989, p. 83), as "one is born with intrinsic motivation" (Scherkenbach, 1991, p. 264). Aguayo (1990) asserts the importance of intrinsic motivation to quality, stating that "In the Deming view, intrinsic motivation is the engine for improvement" (p. 103). But, Aguayo admonishes, management's policies often stifle or discourage a worker's intrinsic motivation (p. 103). Deming (1990) adds, "Management that denies to their employees dignity and self-esteem will smother intrinsic motivation," he says, (p. 13), and "some extrinsic motivators rob employees of dignity and of self-esteem" (p. 14). Under extrinsic motivation, he says, "one is ruled by external forces" (p. 14) and that it is "submission to external forces that neutralize intrinsic motivation" (p. 14).

Aguayo (1990), one of Deming's students, suggests that managers attempting to follow Deming's philosophy should "urge workers to experience the intrinsic rewards that come from doing something well" (p. 45). And Gabor (1990), reporting after doing extensive research on Deming, suggests that the "vast majority of employees," if given the chance by management, "will take pride in their work" (p. 19).

An individual's pride in his work, or Pride of Workmanship "follows naturally" from a worker's efforts at self improvement (Deming, 1986, p. 73; Gabor, 1990, p. 24). Management, therefore, must direct itself toward one aim, that of allowing the individual worker to "experience Joy in Work" (Aguayo, 1990, p. 181). (Pride of Workmanship and Joy in Work appear interchangeably in these works.)

The benefit, says Aguayo (1990), is that Joy in Work brings "unlimited motivation" (p. 103). And, says Deming (1986) if a worker can take pride in his work, he will feel important to his job. And "he that feels important to a job will make every effort to be on the job" (Deming, 1986, p. 83).

This Pride of Workmanship is then an intrinsic reward, one which the worker derives from the task or from work itself, vice a tangible, external or extrinsic reward provided by management. It is a reward the workers will value highly. "The possibility of Pride of Workmanship," explains Deming (1986), "means more to the worker than the gymnasium, the tennis court or the recreation area" (p. 85).

Deming's belief in intrinsic motivation is further revealed by what Deming and his followers tell management not to do. The logic here is that Deming's belief in the importance of intrinsic motivation can be seen not only from his insistence on the importance of Pride of Workmanship, but also from his insistence on removing extrinsic motivation from the workplace in the form of piecework, quotas, and fear of punishment.

Foremost is Deming's admonition to remove the barriers that rob people of Pride of Workmanship, his Point 12. These "barriers" that Deming mentions involve external (extrinsic) rewards and punishments. Deming asserts that these external rewards and punishments stifle or kill a worker's intrinsic motivation by causing him to focus on the external incentives --piece rate pay, incentive pay, quotas, punishment--instead of experiencing the intrinsic rewards of the task, or Pride in Workmanship.

Here we see the principal difference between Deming's philosophy and that of the classic theorists. The classicists, or scientific managers, reward those performing above average and punish those whose performance is below average. Deming however, would pay his employees salaries based upon their experience and responsibilities, believing that their performance is controlled by the system in which they work. Deming's managers, then, would concentrate on improving the system, looking for the real causes of the problems that force an individual's performance to fall below accepted norms, and on eliminating the barriers to Pride of Workmanship (Aguayo, 1990; Gabor, 1990).

These barriers include, among other things, annual ratings, merit ratings, quotas of numbers not quality, management by objective. These barriers to the realization of Pride of Workmanship may in fact be one of most important obstacles to reduction of cost and the improvement of quality in the United States today (Deming, 1988, p. 83).

Certain of these barriers even force workers to produce inferior products (Aguayo, 1990, p. 104). Deming illustrates this point with the anecdote of the worker who complained that his machine was out of adjustment. His supervisor, however, ordered him to continue to operate the machine. "He ordered me to make defective parts, the worker exclaimed. "Where is my pride of workmanship?" he asked (Deming, 1986, p. 72).

In another illustrative story, Deming brings up the hourly worker on piecework. "Where is her Pride of Workmanship?" he asks. To meet her quota, and her supervisor's quota, "she must bury her Pride of Workmanship. She must deny her intrinsic motivation" (Deming, 1986, p. 74).

Here we see the congruence between Deming's philosophy and overjustification theory (Deci, 1975). This is the idea that extrinsic motivators can be emphasized to such a degree that they overshadow any intrinsic rewards an individual may have otherwise realized from his task. That is, the individual shifts the focus of his rewards from himself and the task to the extrinsic rewards offered by others, such as piece rate pay, incentive pay, or special benefits or "perks" such as a personal parking space.

Some of the barriers to Pride of Workmanship, Deming claims--these same extrinsic rewards which Deming believes can cause a worker to "overjustify" and which can stifle or kill intrinsic motivation--will eventually "backfire and burn out" (Deming, 1986, p. 72). Once intrinsic motivation is replaced by extrinsic rewards, intrinsic motivation dies (Aguayo, 1990, p. 200). After a point, extrinsic motivation won't help. But Joy in Work can provide unlimited motivation (Aguayo, 1990, p. 103).

Gabor (1990) states that Deming's emphasis on removing barriers to pride of workmanship "dovetails with the belief in 'intrinsic motivation' put forth by other management theorists" (p. 26), and the theory of variation. In the Deming view, she explains, it is impossible to separate the performance of the individual from the performance of the system. If the system is stable, most workers' performance will be within the accepted norms, and thus impossible to differentiate.

The old system of appraisals and bonuses--external rewards--then, is unfair and harmful to the company and the employees. Because it is based on quotas (See Deming's Point 11), it can never be administered fairly, she argues. It therefore will discourage future performance and employees' intrinsic motivation to do well.

As noted above, a Total Quality organization would not use such a system of appraisals and bonuses to determine worker's pay. Since in a stable system, most workers' performance will be within the control limits, the only pay differentiation would be due to the mastering of special skills or for taking on greater responsibilities on the job. Gabor (1990) notes two U.S. companies which have foregone the traditional system of basing employees' pay on a manager's ratings of their performance. Both American Cyanamid and General Motors scrapped appraisal systems that required managers to rate employees on a bell curve or by numerical order. Instead, both companies recognized that employees should be paid on the basis of their experiences and responsibilities.

Another very apparent admonition is Deming's Point 8, Drive out Fear. Aguayo (1990) explains in very straightforward words that using fear "robs workers of pride and joy in work and kills all forms of intrinsic motivation" (p. 184). Deming cites many examples of fear voiced by workers and supervisors, and lays blame for the prevalence of fear on outdated organizational norms and managerial practices not rooted in quality. As one specific example, Deming suggests that fear "may be attributed in large part to the annual rating of performance" (Deming, 1986, p. 62).

Deming's examples of fear in the workplace highlight the negative aspects of using fear to manage--all are counter to the theory of intrinsic motivation. Workers are focused on their fears of punishment because of what they have done or failed to do. Actual or imagined, this fear of punishment is real to them. They focus on avoiding this negative external reinforcement instead of experiencing pride or joy in their work, instead of deriving rewards from the task itself.

To counter this employee behavior, to eliminate fear, says Aguayo (1990), management must "strive to tap intrinsic motivation" (p. 189). Here Aguayo exhibits the basic Deming argument that by removing barriers--eliminating quotas, management by objectives, the reward system, annual reviews and merit ratings--intrinsic motivation will follow and bloom.

Continuing in this elaboration of Deming, Aguayo (1990) suggests that Deming's Point 13, "Institute a vigorous program of Education and Retraining," "calls for development of intrinsic motivation" (p. 205). In the Deming view, Aguayo says, productivity and wealth come from the efforts of everyone and their harnessing of the mind. Management's job is to see that the organization doesn't get in the way by eliminating barriers to people experiencing joy in their work, and by encouraging each worker to develop himself. The best offense (in the marketplace) then, is to "tap the real source of improvement, your people. . . by encouraging their growth and continual education, and nourishing intrinsic motivation" (Aguayo, 1990, p. 205).

D. BEHAVIORAL SCIENTISTS ON INTRINSIC MOTIVATION AND QUALITY

Deci and Ryan (1985) reviewed "several different lines of research" and concluded that "being intrinsically motivated to learn improves the quality of learning" (p. 256). They quote Gottfried (cited in Deci & Ryan, 1985), whose experiments showed that high intrinsic motivation leads to "high achievement" (p. 256) in reading, math, social studies and science, and several other researchers who reported similar findings (Ryan, 1982; Ryan et al., 1983; Sadowski and Woodward, 1981; Connell and Ryan, 1985). Likewise, Della-Giustina and Deay (1991) report that the quality of their students' work was "highest when (they) perceive themselves to be engaged in a task for their own reasons" (p. 19), which they called intrinsic motivation.

It seems clear, then, that intrinsic motivation is related to academic performance and various experimental studies have confirmed this (Deci and Ryan, 1985). But as far back as 1975, Notz criticized such studies using children and college students playing games. There is a serious question, he said, whether such results would hold up in a mature population, in large organizations and for very large tasks.

Some writers suggest a similar link between intrinsic motivation and quality performance in the workplace, but report no empirical studies to back their statements. Hackman and Oldham (1980), in their argument for job redesign, state that a job with high motivating potential "will promote internal motivation and increase the quality of work performed" (p. 91).

Lawler (1990) echoes Hackman and Oldham's arguments, saying that "certain people are more likely to be motivated intrinsically than are other people. Jobs which are relevant to the person's abilities will bring forth this motivation" (p. 314). When an individual is given an interesting task, Lawler continues, when he is allowed to participate in decisions about how to perform the task, and is given feedback about his performance, his intrinsic motivation is high. "It is high," Lawler writes, "because people feel responsible for how well the work is performed. Quality is the key here. People become motivated to do high quality work...they want to be associated with a high quality product because this satisfies their needs for competence and self-esteem" (p. 31).

Working together, Hackman and Lawler (1971) suggest that certain job characteristics can establish conditions which will enhance the intrinsic motivation of workers. Employees in such jobs reported feeling "internal pressures to take personal responsibility for their work and to do high quality work" (p. 273), and in turn are "rated by supervisors as doing high quality work" (p. 259). Bolman and Deal (1991) reported that job enrichment usually has more impact on the quality than the quantity of production, and cited one study that reported "an average improvement of 28 per cent across 21 job enrichment experiments" (p. 159).

Griffin, Welch and Moorhead (1981) assumed a relationship between intrinsic motivation and quality work based upon Hackman and Oldham's work. From a review of the literature published from 1971 to 1981 they selected 13 works for their study. They report that the empirical tests from the period are "generally disappointing or inconclusive" (p. 656).

Similar to Notz (1975), Griffin et al. (1981) report "reasonable support" (p. 662) for a task design/performance relationship from field surveys, but not from experimental (laboratory) studies. Basic to the problem of establishing any support for their premise was a lack of a widely accepted definition of employee performance, and ways to measure it. There were 14 definitions of performance in the 13 studies Griffin et al. (1981) reviewed, and no two studies measured performance in exactly the same way. For example, Hackman and Oldham (1980) define work effectiveness as consisting of both quality and quantity of output. Similarly, some of the studies reviewed by Griffin, et al. (1981) defined employee performance as comprising quality and quantity of work, "plus several unspecified variables rated by workers' supervisors" (p. 65). Some studies rated an employee's "overall performance" with no defining terms. Griffin (cited in Griffin et al., 1981), in a study included in the review, measured "productivity" or "output adjusted for scrappage" (p. 65). Thus, write Griffin, et al. (1981), performance measures are "at best only moderately valid and meaningful and at worst potentially invalid and meaningless" (p. 662).

In a later work, Helmreich (cited in Deci & Ryan, 1985) conducted research with airline pilots, professional psychologists and business school graduates. He found that performance, which he did not define, was positively correlated with "intrinsic factors" (p. 306).

Shalley and Oldham (1985) cited research that showed a "positive association between measures of intrinsic motivation, risk taking and work quality" (p. 629).

In sum, there appears to be a recognized linkage between intrinsic motivation and quality learning, as shown in various studies. But such a link, though proposed and expounded, has not been empirically established for the workplace. In addition, most testing of intrinsic motivation theory has been done in the laboratory vice in the workplace. Muchinsky (1990) notes that "the limitation of laboratory studies testing intrinsic motivation are particularly acute," (p. 438) and agrees with Mawhinny (cited in Muchinsky, 1990) that the theory should be tested under field conditions as well.

Various studies have included a vague notion of quality work among their outcome variables, but quality has never been well defined nor has it been the primary focus of a study, as have been "quantity produced" and the similarly vague "productivity," which may or may not include quality as a component variable.

Thus, Griffin et al. (1981) recommend, the "performance variables must be more fully defined in terms of its components--quality, quantity, effort--and researchers must develop appropriate techniques to measure them. Further, Griffin et al. (1981) recommend integrative research--that is, integrating the organizational context variables with studies of the task design variables. It is likely, they argue, that performance is a function of a complex set of individual variables--motivation, experience, ability--with group variables--performance norms, cohesion--and organizational variables--task design, structure, technology.

E. CONCLUSION

In conclusion, we see that there appears to be a consensus of opinion held by the quality gurus that workers' intrinsic motivation is important to the pursuit of quality. Deming shares this opinion, as noted in his strongly-worded statements on the importance of workers' intrinsic motivation. Yet empirical support for the link between intrinsic motivation and quality work is inconclusive. Principally, this is because there has been no work done with the express intent to link intrinsic motivation with quality. When quality has been included as an operant variable, it has not been held to be a key element of the study. Rather, it has been just one of many dependent variables. Nor has there been a single, sufficient definition of quality used by the various researchers, which further limits the value of the few studies which have included quality among the variables.

IV. A SPECIFIC MODEL OF INTRINSIC MOTIVATION

The previous chapter demonstrated that quality gurus appear to believe that intrinsic motivation is the dominant motivational basis for quality, but that they offer little explicit theory in this area. This chapter addresses that gap by reviewing existing models of intrinsic motivation and adopting one promising model for further analysis.

This thesis will adopt the model of empowerment from the Thomas/Tymon Empowerment Profile (Thomas & Tymon, 1992b) to explore the link between intrinsic motivation and quality. Recall that intrinsic motivation was defined in terms of positively valued experiences (intrinsic rewards) that the individual derives directly from the task. The Thomas/Tymon model is more explicitly focused on rewards than most theories that preceeded it, and it develops a more comprehensive set of rewards.

But to understand the Thomas and Tymon model, one must trace the evolution of thought concerning intrinsic motivation. This section will briefly follow this line from Herzberg's Motivation-Hygiene Theory, through Hackman and Oldham's Job Characteristics Model, Deci and Ryan's Theory of Intrinsic Motivation, and finally to Thomas and Velthouse's Interpretive Model of Intrinsic Motivation.

A. HERZBERG'S MOTIVATION-HYGIENE THEORY

Though Herzberg (cited in Tymon, 1988) did not explicitly focus his theory upon intrinsic motivation, his emphasis on motivators created the basis for further development of theories on intrinsic motivation and satisfaction associated with the activity of work.

In Herzberg's Motivation-Hygiene Theory, satisfiers, also called motivators, relate to what an individual does (his work). Dissatisfiers, also called hygiene or maintenance factors, relate to the situation in which he does it (the work environment) (Sutz, 1991).

Rather than speak of intrinsic rewards, Herzberg used the notion of job satisfaction. He hypothesized that job satisfaction results from motivators, or satisfiers inherent in the work itself. And conversely, dissatisfaction with the job results from a lack of hygiene or maintenance factors present in the job situation.

Herzberg called satisfiers motivators since "his findings suggested to him that they were effective in motivating the individual to superior performance and effort" (Tymon, 1989, p. 16). Thus, he saw a requirement for motivators within the job "to produce positive job attitudes and to motivate individuals (Tymon, 1989, p. 16).

Those motivators which contribute to job satisfaction, Herzberg said, are achievement, recognition for achievement, the work itself, responsibility, and advancement. Job dissatisfaction results from such variables as company policy and administration, supervisors, salary, interpersonal relations and working conditions.

B. HACKMAN AND OLDHAM'S JOB CHARACTERISTICS MODEL

Hackman and Oldham (1980) further developed the motivator or satisfier portion of Herzberg's model, explicitly using the concept of intrinsic motivation. Currently a popular perspective on job design, Hackman and Oldham's model focuses on producing intrinsic motivation through the structure of the job. Their model identifies five job characteristics: skill variety, task identity, task significance, autonomy and feedback. These in turn influence three critical psychological states: caring about an activity (experienced meaningfulness from the work), feeling personally accountable for outcomes (experienced responsibility for results), and learning about the results of one's efforts (knowledge of results) (Lee, 1987). The more these three psychological states are experienced in the task, the greater the individual's intrinsic motivation, satisfaction and performance (Lee, 1987).

The Hackman and Oldham model is not specific about the nature of the reward(s) which underlie intrinsic motivation. But Lee (1987) interprets the model to suggest that the rewards derived from work are the positive feelings associated with the task itself, and Tymon (1989) says the rewards are "those positive feelings which follow from good performance, and the negative feelings which follow from poor performance" (p. 23).

C. DECI AND RYAN'S THEORY OF INTRINSIC MOTIVATION

Deci and Ryan's (1985) model of intrinsic motivation has often been cited in the social psychology literature, though it also has been criticized for its reliance on games and puzzles in laboratory experiments vice field research in actual work settings. Still, it is the basis for much later work on intrinsic motivation.

According to Deci and Ryan, it is an individual's need to feel competent and self-determining that is the driving force in motivating him to seek and attempt to conquer challenges. An individual's reward, then, they said, is a feeling, or set of feelings, following his actions. "There are no rewards separate from the spontaneous, internal states that accompany or immediately follow the behavior," they said (cited in Tymon, 1989, p. 26).

When an individual's behavior has been such that he perceives his competence to have increased, Deci and Ryan (1985) suggest, his intrinsic motivation also is enhanced. However, two conditions must exist in order for an individual's intrinsic motivation to be enhanced--the task must be "optimally challenging" (cited in Lee, 1987, p.15) and there must be a perceived self-determination of competence.

The first condition--that the task be optimally challenging--means that activities seen as simple and trivial will not prove challenging, even when the individual feels extremely competent. Thus, intrinsic motivation will not be enhanced.

The second condition--that there is a perceived self-determination of competence--means that he is choosing of his own free will to engage in the task activities--that his behavior is not being determined or controlled by others.

Deci and Ryan (1985) suggest that intrinsic motivation leads to feelings of interest and enjoyment, and they note that an intrinsically motivated individual will persist in an activity even after a period during which his activity was supervised or monitored. Deci and Ryan (1985) also assert that greater creativity and more cognitive complexity result from intrinsic motivation (cited in Tymon, 1988).

D. THOMAS AND VELTHOUSE'S INTERPRETIVE MODEL OF INTRINSIC MOTIVATION

Thomas and Velthouse (1990) defined empowerment in terms of intrinsic motivation. Building upon the works of Deci and Ryan and of Hackman and Oldham, they designed a model of empowerment/intrinsic motivation which incorporates a wide range of causal variables and which would specifically apply to work situations. In their model Thomas and Velthouse say that intrinsic motivation involves positively-valued experiences (rewards) that individuals derive directly from a task, or "those generic cognitions by an individual, pertaining directly to the task, that produce motivation and satisfaction" (Thomas and Velthouse, 1990, p. 668).

Here they further define "task" in such a way as to go beyond Deci's (1975), and Deci and Ryan's (1985) model which referred only to task activities. For Thomas and Velthouse, task refers to "a set of activities directed toward a purpose" (Thomas and Velthouse, 1990, p. 668). Thus, the intrinsic rewards derived from a task stem from the task purpose as well as the performance of task activities.

The core of their model, Thomas and Velthouse (1990) said, involves identifying an individual's cognitions about a task, called task assessments, which are presumed to be the "proximal cause" (p. 668) of intrinsic motivation and satisfaction. These cognitions occur within the person and refer to the task itself, rather than the work situation or any external punishments or rewards administered by others.

Specifically, Thomas and Velthouse (1990) say that an individual's intrinsic rewards come from four task assessments: impact, competence, meaningfulness, and choice. Impact is the "degree to which behavior is seen as "making a difference" in terms of accomplishing the purpose of the task" (p. 672). Competence is defined as "the degree to which a person can perform task activities skillfully when he or she tries" (p. 672). Meaningfulness "concerns the value of the task goal or purpose, judged in relation to the individual's own ideal or standards" (p. 672). Choice is described as the degree to which an individual sees himself as freely choosing his task behavior, as opposed to being constrained or forced to perform the behavior by external events (p. 672).

In addition, Thomas and Velthouse (1990) list five behavioral outcomes associated with increased intrinsic motivation. These are: increased activity, concentration, initiative, resiliency, and flexibility (p. 670).

Thomas and Velthouse (1990) see the task assessments as based-upon a worker's interpretations of external events. These interpretations are formed both by the relatively objective (factual) data that workers receive from external events and by the "interpretive styles" (Sutz, 1991, p. 12) which workers use to make sense of that data.

External data are influenced by such external factors as reward and feedback systems, by leader's style, by job design, and other factors. To make sense of these data, however, the worker must also interpret them, in effect "adding meaning" to factual perceptions by drawing conclusions about how well things are going (evaluation), about what may have caused past events (attribution), and about what could happen in the future (envisioning). Thus, the worker's task assessments are also influenced by styles or biases in the ways he or she goes about evaluating, attributing, and envisioning--so that different workers may make quite different task assessments based on the same data.

E. EXTENSION OF THE THOMAS/VELTHOUSE MODEL BY THOMAS AND TYMON

The Thomas-Velthouse model was tested by Lee (1987) and Sutz (1991), and further tested and refined by Thomas and Tymon (1992a). In their recent work, Thomas and Tymon (1992a) operationalized and tested central features of the Thomas and Velthouse model, verifying that the four task assessments--competence, impact, meaningfulness, choice--are distinct concepts for managers, and showing a strong relationship between task assessments in the model and the expected outcome measure of job satisfaction.

In addition, Thomas and Tymon (1992a) further clarified how the task assessments serve as intrinsic rewards. While "the task assessments generate immediate (positive) affect and also shape expectancies regarding future values of these variables," they wrote, "the task assessments are not themselves expectancies. Rather, they are judgments about the present that, by generating positive affect, serve more immediately as cognitive rewards" (p. 6).

As they factored the results of their questionnaire, Thomas and Tymon (1992a) found that those responses regarding the cognitions of progress and impact tended to band together in the same factor, which they called "impact." In later results, however, the sense of impact appeared to be an aspect of meaningfulness. As a result, Thomas and Tymon dropped impact as a separate task assessment and substituted the term progress for the fourth task assessment. In their Empowerment Profile, Thomas and Tymon (1992b) define progress as "the sense that the task purpose is being realized, that movement is actually occurring along the path toward the purpose" (p. 3).

In their Empowerment Profile, Thomas and Tymon (1992b) have continued to develop the notion of the four task assessments as rewards, and have interpreted them as "feelings of empowerment" in the 2x2 grid shown in Figure 1.

	Type of Feeling:	
Subject of Feelings:	Feeling of Potential	Feeling of Realization
Task Activity	Choice	Competence
Task Purpose	Meaningfulness	Progress

FIGURE 1. THE FOUR FEELINGS OF EMPOWERMENT
THOMAS/TYMON EMPOWERMENT PROFILE

The 2x2 grid arranges the four feelings of empowerment along the axes of Task Aspects and Types of Feeling. The two aspects of a task, or Subjects of Feelings, are the Task Activities an individual performs, and the Task Purpose he or she tries to achieve. Task Activities provide an opportunity for feelings of Choice and Competence, while the Task Purpose provides an opportunity for feelings of Meaningfulness and Progress. The two major types of feelings an individual has about a task are Feelings of Potential, which include the task assessments Choice and Meaningfulness, and Feelings of Realization, comprising the task assessments of Competence and Progress.

In extending the Thomas/Velthouse model, Thomas and Tymon (1992b) also expanded their definitions of the four task assessments:

Choice, they said, is the "potential to select the task activities that make the most sense...and to perform them in the way that seems most appropriate to achieve the task purpose." The feeling of choice is an individual's feeling of "being free to choose, having time and space to decide how to do things, of being able to use his or her own best judgment and to act out of his or her own understanding of the task" (p. 2).

Competence is an individual's sense that he or she is successfully performing the task activities he or she has chosen. The experience of competence gives an individual the sense that he or she is doing good, quality work on a task.

Meaningfulness involves the potential that is in the task purpose--its value or worth if achieved. Meaningfulness is "an individual's feeling that he or she is on a valuable mission, that his or her purpose matters in the larger scheme of things" (p. 2).

Progress involves the sense that the task purpose is being realized--that movement is actually occurring along the path toward the purpose. The feeling of progress "gives the individual the sense that the task is moving forward, that his or her activities are really accomplishing something" (p. 2). This model from the Empowerment Profile has potential application to future studies of empowerment and intrinsic motivation. It is this profile that this thesis will use in attempting to establish a link between intrinsic motivation and quality.

F. CONCLUSION

The Thomas/Tymon model has the potential for adding more specificity to understanding what intrinsic motivation is, beyond Deming's simple phrase "Pride of Workmanship." It provides a more clearly defined description of four component feelings that make up the experience of pride of workmanship--competence, choice, meaningfulness and progress.

These four component feelings, in turn, provide more specific targets for managers and researchers interested in increasing intrinsic motivation in work settings.

V. HOW WELL DOES THE THOMAS/TYMON MODEL FIT DEMING?

The question addressed in this chapter is how clearly the four feelings in the Thomas/Tymon model appear to match Deming's thinking about intrinsic motivation. That is, does it appear that the Thomas/Tymon model makes more explicit what is already in Deming's thinking about Pride of Workmanship? More specifically, does Deming appear to recognize the importance of competence, choice, meaningfulness and progress to worker motivation?

A quick reading of Deming and his chroniclers indicates that his philosophy would match this model and its four task assessments. While Deming does not use these specific terms--choice, competence, meaningfulness, progress--the words and phrases he uses seem to represent the same ideas.

A. THE FOURTEEN POINTS

The first attempt to relate Deming's philosophy with the four task assessments met with limited success. In an attempt to align the Fourteen Points with each of the task assessments, it became clear that not all of the points would have a logical or unarguable relation with one of the four task assessments. Those which made a logical fit are:

Task Assessment	Deming's Point	
Choice	Point 8:	Drive Out Fear
	Point 11:	Eliminate Quotas
Competence	Point 6:	Establish a Program of Training and Retraining
	Point 13:	Begin a Program of Education and Self Improvement
Meaningfulness	Point 1:	Create Constancy of Purpose
	Point 2:	Adopt the New Philosophy
Progress	Point 5:	Improve Constantly
	Point 9:	Break down Barriers between Staff Areas
	Point 14:	Take Actions to Accomplish the Transformation

These are nine of the famous fourteen, leaving five points for which there was no clear connection with the Thomas/Tymon model. These other five points address the organization's personnel programs and management's business practices, which do affect workers' abilities to turn out quality products. But they do not address workers' motivation. Nine of 14 was not thought to be a strong enough correlation to establish a fit between Deming and the Thomas/Tymon model.

B. DEMING'S WRITINGS, PART I: CHOICE AND COMPETENCE

The next step was to find citations from Deming's writing, or from the writings of his chroniclers, illustrating his philosophy with respect to the four feelings (intrinsic rewards) in the Thomas/Tymon model. These writings were searched for statements or stories about worker motivation which demonstrated the importance of a given feeling.

Recall that for Thomas and Tymon, a task involves both activities and purpose, so that intrinsic rewards involve both. This section will begin matching Deming's writings with the two rewards most directly related to task activities--Choice and Competence. Here the fit is easy to see.

1. Choice

Choice, Thomas and Tymon (1992b) say, is the potential for the worker to "select the task activities that make the most sense, to decide how to do things, to use his own best judgment" P. 2). In his writing, Deming indicates a similar belief primarily by expounding against those practices which negatively affect a worker's ability to make a choice.

Among the obstacles preventing Pride of Work, and which also prevent a worker's experiencing choice, Deming cites the lack of authority to do what needs to be done, red tape, and specifications that constrain creativity (Aguayo, 1990, p. 200). These obstacles conspire, Deming says, to make people "afraid to contribute to the company. Don't violate procedures" they are told. "Do it exactly this way" (Walton, 1990, p. 73).

Deming (1986) quotes a worker who said, "I'm afraid to put forth an idea." Another worker told him, "If I did what was best for the company, long term, I'd have to shut down production for a while for repairs and overhaul. My daily report on production would take a nose dive, and I'd be out of a job" (p. 60).

Deming (1986) tells the story of a worker who stopped his machine to adjust it, but the foreman told him simply to "run it." In effect, he told the worker to make defective parts. The worker had no choice to do quality work or to do what he knew was right. (p. 76)

Deming wrote of the telephone operator whose job was to answer 25 calls per hour and to give the customers courteous satisfaction. Deming claims that her job could be either/or--either to answer 25 calls in an hour or to give the customers courteous satisfaction--but the many obstacles in her way left her no choice which she was to do. Thus, the customer's satisfaction, her performance on the job, and the company's reputation all suffered. (Gabor, 1990, p. 22)

In another anecdotal example, a loading dock worker sized up the situation and made a choice of actions which, in retrospect, were correct. The supervisor stopped him, and gave conflicting and incorrect instructions which cost the company much time and money. This worker too was not allowed to use his own best judgment to use the most appropriate means to achieve the task purpose. (Aguayo, 1990, p. 179)

2. Competence

Thomas and Tymon (1992b) say that Competence is an individual's sense that he is successful in the task activities he has chosen, and the sense that he is doing good, quality work on a task. Though Deming never uses the word Competence, he does write of workers ably performing quality work, and the need for training so they may perform their work well. Deming is adamant that workers must be trained in their jobs in order to be competent and to experience pride of workmanship. He also insists that workers must be given the proper resources--time, proper tools and equipment--in order to exhibit their competence and to experience pride of workmanship. (Aguayo, 1990, p. 200)

"There is no excuse to offer," Deming says, "for putting people on a job that they know not how to do" (Walton, 1990, p. 71). Many workers reveal that they never really learned to do their jobs. One worker explained to Deming, "they give you no instructions. What they do is to set you down at a machine and tell you to go to work" (Deming, 1986, p. 52). An officer in one of Deming's client companies admitted, "People that I thought weren't doing a good job are not doing a good job because they don't know how. They're not trained properly" (Walton, 1990, p. 234). Further, Deming (1986) cites as an "inhibitor to improvement" (p. 7) inadequate training in technology which is also an inhibitor to workers' competence.

One example of a company understanding the importance of training and taking the time to ensure that all workers are well trained is that exhibited by the New United Motors Manufacturing, Inc. (NUMMI) auto manufacturing plant in

Fremont, CA. After start-up, the plant took 18 months to reach full capacity, 18 months in which workers were fully trained to do their jobs. Management's primary concern, they explained, was that everyone understand his job. This dedication to training seems to have paid off--after 18 months of training and low production numbers, NUMMI workers began producing more cars at higher quality and lower cost than U.S. auto plants which typically reach full capacity within six months after start up. (Aguayo, 1990, p. 48)

Deming also is concerned that workers be given the proper tools and supplies to do quality work. He cites management's failure "to provide the means to the ends it proclaims" when it buys poor material or fails to maintain machinery. "How could a man make it right the first time when the incoming material is off gauge, off color, or otherwise defective, or if his machine is not in good order, or if the measuring instruments are not trustworthy?" (Deming, 1986, p. 66; Walton, 1990, p. 76)

Waxing eloquent, Deming claims that one's work is one's self portrait. "Would you sign it?" he asks. "No!" he answers. "Not when you give me defective canvas to work with, paint not suited to the job, brushes worn out, so that I can not call it my work." (Deming, 1986, p. 65)

There are many other assaults on workers' competence, Deming believes. Quotas and work standards do not help. "I have yet to see a work standard that includes any trace of a system which would help anyone do a better job," Deming said (Walton, 1990, p. 78).

Similarly, slogans and exhortations encouraging workers to work harder demean the workers and their competence when they also demand some numerical level of production that is beyond the system's capability (Aguayo, 1990, p. 202). Implicit in such sloganeering is the supposition that employees could, if they tried, do better. They are offended, not inspired (Walton, 1990, p. 76). The aim of leadership, Deming says, "should be to help people, machines, and gadgets to do a better job" (Gabor, 1990, p. 23). Likewise, leadership must make clear to workers the extent of the entire process and their individual parts in it. As one worker told Deming, "I could do my job better if I understood what happens next" (Deming, 1986, p. 60). Deming and his chroniclers cite many examples of improved quality and worker competence following visits and tours of customers' facilities and plants--they then understood what happens next to the product after it leaves their process.

Another prime requirement for workers to exhibit competence is a clear explanation of expected quality. As noted earlier quality must be negotiated between customer and supplier, and all parties must be in agreement and understand their contributions. Yet all too often workers are not given clear instructions on what is required of them, nor are they given a good explanation of quality. Deming cites many examples of workers complaining that they couldn't find out what their jobs were or that they were afraid to ask. He asks, "How can anyone on the factory floor take pride in their work when he is not sure what is acceptable workmanship?" (Deming, 1986, p. 77).

C. DEMING'S WRITINGS, PART II: MEANINGFULNESS AND PROGRESS

The examination now turns to the two feelings related to the task purpose--Meaningfulness and Progress. Here it appears that the Thomas/Tymon model is consistent with Deming, but is more general. Deming focuses upon a subset of possible task purposes--the pursuit of customer satisfaction in relatively repetitive tasks. Here, meaningfulness is associated with contributing to the goal of customer satisfaction, and progress takes the form of continuous improvement in repetitive task processes.

1. Meaningfulness

Thomas and Tymon (1992b) define Meaningfulness as "an individual's feeling that he is on a valuable mission, that his purpose matters in the larger scheme of things" (p. 2). It concerns the value of the task or purpose, judged in relation to the individual's own standards; that is, the potential value of the task purpose if it is achieved.

Deming emphasizes the importance of meaningful purpose or goals to the worker. He is quite straightforward--"The company has an obligation to make sure the individual is given meaningful work to do" (Gabor, 1990, p. 28). More specifically, the purpose he emphasizes is quality (defined in terms of customer needs). It is this purpose which Deming sees as providing meaning for the worker.

In explaining his Point 1, Create Constancy of Purpose, Deming explains the need for a company to have an overall plan which must provide for a way to satisfy the customer. Closely related is Deming's Point 7, Institute Leadership, which takes the organization toward this purpose.

Deming clearly indicates the need for the manager, the workers and the customer to have a shared value system which allows them to negotiate and agree upon an acceptable definition of quality and a method through which to achieve it. This negotiated agreement allows each to accept the importance of the other's independent yet mutually supporting roles in achieving quality and (customer) satisfaction.

Managers can help to impart these values to the workers through the organization's culture and through training which includes more than the mechanics of the job tasks. "Training for a job must teach the customer's need," says Deming (1986, p. 53). As workers understand not only how to do their job tasks, but also why they perform certain tasks in certain ways, their abilities and motivation to contribute to quality greatly increase. As one executive told Deming, the people in his company "aren't doing a good job because they don't know the importance of their job" (Walton, 1990, p. 234).

It is a great waste of effort and energy to have workers doing tasks that don't contribute to the organization's purpose. Even worse, Deming says, "People charging this way and that (without guidance of principles) can do a lot of damage" (Deming, 1986, p. 19). But this experience is widespread throughout corporate America, Deming notes, and it manifests several forms of aberrant behavior. There are workers paid to produce defects, which do nothing to contribute to customer satisfaction and quality; there are workers who are paid to rework the defects, at further cost to the organization and making no contribution to the organization's purpose; and there are those sections which do their own work well, but not in harmony with the organization's purpose and goals, and actually detract from the organization's effectiveness.

Most companies, Deming says, have no competent guidance (vision), no system for continual improvement. "People go off in different directions [with] no chance to work to the best advantage of the company" (Deming, 1986, p. 465). Further detracting from workers' efforts to serve the best interests of the company, Deming claims, is the "necessity to satisfy specified rules, or at all costs, a quota of production" (Deming, 1986, p. 61). Deming has clearly stated his objection to production quotas that rob workers of their choice to turn out only quality products and parts, and to quotas that demand only production numbers, not levels of quality. Workers, he says, understand this difference and don't necessarily share their supervisor's view that numbers count more than quality. As one worker told Deming, "It is demoralizing and counterproductive to deliberately make bad parts" (Walton, 1990, p. 232).

Too often these bad parts are reworked in an attempt to bring them "up to specs" or to otherwise make them usable. This reworking of defective parts doesn't contribute to the company's achieving its task purpose, its achievement of quality, nor does it contribute to profitability.

Just as bad is the situation in which staff sections or even corporate divisions "sub-optimize" their own work. That is, they establish their own task purposes and perform them well, oftentimes very well, but at the expense of the another section or division, and ultimately at the expense of the greater organization. Their tasks do not contribute to the organization's larger purpose. It is the leader's job to coordinate the various talents and tasks, Deming (1986) says, so that they all contribute to the organization.

Management, Deming says, prevents workers from making a meaningful contribution to the improvement of their jobs, and robs them of the self-esteem they need to foster motivation (Gabor, 1990, p. 13), often by its own best intentions gone awry. When managers proclaim their good intentions yet their actions don't support those intentions, they have created a cynical climate that, by its lack of caring, does not encourage workers' commitment. One worker told Deming, "I'd like to understand better the reasons for some of the company's procedures, but I don't dare ask about them" (Deming, 1986, p. 61).

2. Progress

Thomas and Tymon (1992b) define progress as "the sense that the task purpose is being realized, that movement is actually occurring along the path toward the purpose" (p. 2).

They write of the need for positive feedback from the customers, through which the worker and the manager get some sense of whether they are accomplishing their purpose of satisfying the customers with their product or service, and thus can experience progress toward that goal. Likewise, it gives them an opportunity to continuously improve and realign their task activities to better meet that purpose.

Progress can take different forms, depending on the nature of the task. For lengthy, one-time tasks, progress can take the form of meeting milestones. However, Deming's focus is clearly upon repetitive tasks or processes. And his notion of progress involves continuous improvement in those processes.

Managers and workers will know when there has been progress--when they have shrunk the control limits to get less and less variation in the process, less and less variation among all the workers' output (or less and less difference between people) and less and less variation in the individual worker's output (Deming, 1986, p. 92).

Deming (1986) asks what has been done to constantly improve the product and the service (p. 26). "Is every job... done better than the one before? Is there continual improvement of the skills of people at work or on the job and of repeated operations?" (p. 50).

A production worker, when he has reached statistical control, "has put into the process all that he has to offer," says Deming (1986, p. 405). It is management's job, he contends, to enable workers to give all that they have to offer to improve the system, and to better understand the operation (p. 11).

Deming relates the story of the workers who spent much of their time correcting plates that came to them warped by the previous process. "We could turn out more work," they told him, "if we didn't have to spend our time straightening out those warped plates" (Deming, 1986, p. 82). Similarly, a machinist told Deming that she spent a "substantial fraction of her time" changing tools because those that management bought at the cheapest price were too soft and of inferior quality. "I could turn out much more work were it not for those poor tools" she said (Deming, 1986, p. 79)

D. CONCLUSION

It is clear that Deming focuses upon a subset of possible tasks and task purposes in organizations. Nevertheless, the Thomas/Tymon model fits Deming's motivational assumptions reasonably well. All four feelings of the model--choice, competence, meaningfulness, progress--seem to be important aspects of worker motivation for Deming. Thus, the Thomas/Tymon model appears to make explicit some of Deming's more implicit assumptions about worker motivation--what comprises the elements of Pride of Workmanship.

VI. SUMMARY AND RECOMMENDATIONS

This thesis has examined the link between intrinsic motivation and quality, with special emphasis on the views of Deming and other Total Quality writers. A short summary of the chapters follows, with recommendations for practitioners of Total Quality management and for those pursuing further research on the link between intrinsic motivation and quality.

A. QUALITY

The thesis first traced the evolution in American attitudes toward quality, identifying three major "stakeholders"--managers, customers, and workers--who, through the years, have had varying roles in defining quality. The first of these stakeholders, the managers, defined quality for the customers and for the workers under the traditional, or scientific management model. The workers produced according to the managers' definitions and that is what the customers bought. Eventually the customers took a greater role in defining a quality product. But it was not until the workers' contributions to the definition and production of quality were recognized that the Total Quality movement was possible. Accordingly, then, this thesis proposed a working definition of Quality:

> Quality is an evaluation of work performed, product made or service rendered, according to criteria negotiated by the three primary stakeholders in the process--managers, customers and workers.

B. INTRINSIC MOTIVATION

The thesis next examined existing evidence for a link between intrinsic motivation and quality. From Thomas and Velthouse (1990) this thesis took the following working definition of intrinsic motivation:

> Intrinsic motivation involves positively valued experiences that the individual derives directly from the task (p. 668).

The thesis then reviewed the works of Total Quality writers for their views on intrinsic motivation, and for any connection that might have been made between intrinsic motivation and quality. While no one is explicit in stating such a link, all seem to be of the opinion that there is some connection between intrinsic motivation and quality.

The behavioral scientists offered considerable opinion but little empirical support for such a connection. Deci and Ryan (1985) concluded that intrinsic motivation contributes to the quality of learning, and Della-Giustina and Deay (1991) noted that students who were intrinsically motivated turned in high quality work. Hackman and Oldham (1980) suggested a link between intrinsic motivation and quality work, and others cited research which showed a positive association (Shalley,

1985) or positive correlation (Helmreich, cited in Deci & Ryan, 1985) between intrinsic motivation and quality work. But most experiments yielded inconclusive results (Griffin et al., 1981). Few studies held quality as a primary variable, and even when they did, there were a variety of differing definitions used. Several researchers have called for further work involving quality, especially utilizing field studies in organizational settings (Griffin et al., 1981).

C. INTRINSIC TASK REWARDS

The thesis then reviewed theories of intrinsic motivation for a more specific identification of the "positively valued experiences" (rewards) which make up intrinsic motivation. The theory adopted was proposed by Thomas and Tymon (1992a), who extended earlier works by Thomas and Velthouse (1991), which in turn was based largely on the earlier intrinsic motivation theories of Deci and Ryan (1985) and Hackman and Oldham (1980). Thomas and Velthouse (1990) defined a task as "activities directed toward a purpose" (p. 668), so that intrinsic task rewards include experiences related to both the task activities performed and the task purpose pursued. Specifically, Thomas and Tymon (1992b) identify four such experiences: choice and competence (associated with task activities) and meaningfulness and progress (associated with task purpose).

D. MATCHING THOMAS/TYMON TO DEMING

The thesis then looked at the works of Deming and his followers, principally Walton, Aguayo and Gabor, in an attempt to establish a match between Deming's motivational assumptions and the four task rewards in the Thomas/Tymon model of intrinsic motivation. Various stories and examples of motivational reasoning in the writings of Deming and his followers were cited which illustrate Deming's apparent belief in the importance of these four task rewards.

Based upon this analysis, it was proposed that the four Thomas/Tymon task rewards were a promising theoretical foundation for explaining the motivational basis of quality for workers in Total Quality organizations.

E. RECOMMENDATIONS

1. Total Quality Theory

Thus established, this linking of intrinsic motivation to quality adds to the Total Quality philosophy the consideration of intrinsic motivation as an ingredient of quality. Once it is recognized, managers attempting to adopt the Total Quality philosophy as espoused by Deming must accept, and nurture, the conditions which will fosters workers' intrinsic motivation. As noted earlier, these conditions are oftentimes quite opposite those to which American managers have become accustomed.

Linking intrinsic motivation to quality through the Thomas/Tymon model would add to Deming's philosophy a more explicit motivational model for implementation and provide a basis for measurement and improvement in Total Quality fashion of motivational factors in Total Quality. It has often been said that Deming doesn't tell his clients how to put his philosophy into practice. The Thomas/Tymon model could provide Total Quality managers with a guide to the elements of the four intrinsic task rewards.

The next theoritical step would seem to be to further align the Thomas/Tymon model and Deming's motivational assumptions in order to provide Total Quality managers with useable guidelines to foster workers' intrinsic motivation, to give managers the tools to begin such work and to measure progress toward fostering intrinsic motivation. Of special importance is the identification of specific variables which shape the four task rewards.

If managers are to create or foster intrinsic motivation within their organizations, they must also have some way to measure it, or the lack of it. Currently, there is no accepted definition of intrinsic motivation which all can use, and there are no standards by which intrinsic motivation is recognized or measured. In Deci's experiments, subjects either exhibited tendencies of intrinsic motivation or they didn't, and other than counting the difference of a few seconds spent on a task, Deci had no other measure of relative strength of intrinsic motivation within a subject or between subjects. Measuring the four feelings in the Thomas/Tymon model provides a possible way to determine levels of intrinsic motivation.

2. Future research

This thesis, by citing the writings of quality experts and behavioral scientists, has established intrinsic motivation as a probable contributor to quality. In scientific terms, however, this link is a theoretical proposition which requires further testing for verification. First, there is a need to test the primary premise of this thesis--that there is a link between intrinsic motivation and quality. To conduct such research there first must be an acceptable definition of quality that is acceptable to researchers and Total Quality practitioners and theorists. Further, if there is established a link between intrinsic motivation and quality, what is the strength of that link? That is, how important is a worker's sense of intrinsic motivation to his ability to produce quality?

Second, there is the need to test whether the four feelings (task rewards) in the Thomas/Tymon model are in fact related to quality in work settings. Will the presence of the four task assessments result in higher quality? Will the lack of one or more of them, or an imbalance among them, decrease quality? Here there is a definite need for field research, since past research has been criticized for its reliance on laboratory studies. Scholars have questioned whether laboratory studies can have a true relation to actual work situations with their complex tasks (Notz, 1975).

One interesting additional research issue involves whether, as Deming seems to believe, simply removing barriers to intrinsic motivation is a sufficient strategy for optimizing quality. That is, if intrinsic motivation is not stifled, if the barriers and obstacles are removed, will intrinsic motivation develop and grow to its optimal value within the organization's workers? Or can managers go beyond this value by taking an active role in nurturing intrinsic motivation within their workers through various strategies?

F. CONCLUSION

Traditional methods of management and defining quality cannot compete in today's marketplace which demands Total Quality. While there are any number of "quality gurus" writing and speaking today, one element of Total Quality on which they are not explicit is a worker's intrinsic motivation. This thesis has investigated the linkage of intrinsic motivation to quality, proposed the Thomas/Tymon model as a basis for fostering intrinsic motivation in a Total Quality organization, and suggested several areas for further research.

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